

REMARKS

By the present amendment, claims 4, 9-10 and 13-14, and 18-20 have been canceled.

Further, the claims have been amended as follows:

- In claim 1, “includes” has been replaced by “comprises”
- In claims 2, 10, and 15: “and/or” has been replaced by “(i), (ii), or both (i) and (ii)” in claim 2 and by “having at least one of the following properties: (i), (ii), (iii), (iv), (v)” in claims 11 and 15: phrases introduced by “especially” have been deleted (claim 20 has been cancelled)
- In claims 3 and 6: phrases introduced by “in particular” have been deleted (claims 10, 14 and 20 have been cancelled)

New dependent claims 21-27 have been added to recite the expressions introduced by “especially” and “in particular” which have been deleted as discussed above.

Further, claim 1 has been amended to be presented with separate paragraphs and to recite that printed indicia comprise a first set of lines printed on the front side and a second set of lines printed on the reverse side,

the first and second sets of lines being arranged to form a two-dimensional image when observed in transmitted light, wherein the two-dimensional image has the appearance of a three-dimensional image.

Support for these recitations is immediately derived from the original application, in particular on page 3, lines 5-13, page 5, lines 15-25, and page 6, lines 12-21, for example, line 19 (“single grid pattern [inherently a 2D image] with a 3D effect [appears to be a 3D image]”).

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Claims 1, 3, 5-8, 11-12, 15-16 and 21-27 are pending in the present application. Claim 1 is the only independent claims.

Objection to the title

In the Office Action, the title is objected to.

The Examiner's suggested title "DOUBLE SIDE PRINTED SECURITY DOCUMENT" has been adopted. Accordingly, it is submitted that the objection should be withdrawn.

Lack of enablement rejection

In the Office Action, claims 9-10 and 13-14 are rejected under 35 U.S.C. 112, first paragraph, as not enabled.

The objected claims have been cancelled in order to reduce the number of issues in this application. Accordingly, the rejection is moot.

Indefiniteness rejection

In the Office Action, claims 1-4, 6-7, 10-11, 14-16, and 19-20 are rejected under 35 U.S.C. 112, second paragraph, as indefinite. The following expressions are alleged to be indefinite:

- In claim 1, "document that includes, as security element"
- In claims 2, 11, 15, and 20, "and/or" and "especially"
- In claims 3, 6, 10, 14, and 19, "in particular"
- In claim 4, "large" and "very"

Reconsideration and withdrawal of the rejection is respectfully requested. The objections have been addressed as follows:

- In claim 1, “includes” is replaced by “comprises”
- In claims 2, 11, 15: “and/or” is replaced by “(i), (ii), or both (i) and (ii)” in claim 2 and by “having at least one of the following properties: (i), (ii), (iii), (iv), (v)” in claims 11, 15, and phrases introduced by “especially” are deleted (claim 20 has been cancelled)
- In claims 3 and 6: phrases introduced by “in particular” are deleted (claims 10, 14, and 19 have been cancelled)
- Claim 4: canceled

In view of the above, it is submitted that the rejection should be withdrawn.

Art rejections

In section 9 on page 4 of the Office Action, claims 1-11, 13-15, and 17-20 are rejected under 35 U.S.C. 102(a) and (b) as anticipated by CA 2335239 to Zeiter et al. (“Zeiter”).

Also, in section 11 on page 5 of the Office Action, claims 1-20 are rejected under 35 U.S.C. 103(a) as obvious over US 5449200 to Andric et al. (“Andric”) in view of Zeiter.

Further, in section 12 on page 6 of the Office Action, claims 12 and 16 are rejected under 35 U.S.C. 103(a) as obvious over Zeiter in view of US 6402888 to Doublet et al. (“Doublet”).

It is alleged in the Office Action that Zeiter discloses a three-dimensional moiré effect formed by lines disposed in a fine pattern on opposite sides of a transparent material.

Reconsideration and withdrawal of the rejections is respectfully requested.

Zeiter uses the precise positioning of its indicia on the front and back faces of its transparent sheet to form a moiré effect, but the 3D image in Zeiter is an actual 3D image, i.e.,

the 3D effect of Zeiter is due to the fact that some lines are on the front and other lines are on the back. In other words, the appearance of a 3D image in Zeiter is not an appearance but an actual 3D image, due to the fact that the pattern of Zeiter has an actual depth in the manner of a hologram.

In contrast, in the presently claimed invention, instead (or in addition to) a 3D effect caused by the formation of an actual 3D image, the appearance of a 3D effect is obtained by the precise positioning of lines so that, when they are seen in superposition, they form a 2D pattern that looks like a 3D image. In other words, an actual depth of the image is not required, but the 2D pattern formed by the lines gives a visual impression of a 3D image.

Reference is made to the illustrative sample submitted with this paper, in the form of a specimen banknote. A color scan of each side of the banknote is attached with this paper.

On the front face of the banknote, two “100” patterns were printed, wherein each middle “0” comprises a set of quasi parallel lines. If one looks carefully at the scan, focusing on the middle “0”, one can see that the lines exhibit slight distortions locally.

On the back face of the banknote, two reversed “100” patterns are printed, wherein each middle “0” also comprises a set of quasi parallel lines with slight distortions.

When the banknote is seen in transmitted light, the superposition of the front and back faces results in that the middle “0” appears to be a 3D image of a grey “0” (i.e., the periphery of the “0” seems closer to the viewer than the center). This 3D appearance is due to the slight distortions in the set of lines, which is made possible by a very precise printing of the lines.

More precisely, outside of the “0”, the lines on the front and on the back are perfectly superposed when seen in transmitted light, whereas in the area of the “0”, the lines are not superposed due to their local distortion, which causes a shadow effect. This shadow effect is viewed as a 2D image by a viewer, but there is a visual impression of a 3D image due to the different line density and/or line shape in the central area of the “0” and at the periphery of the “0”. In other words, the central area of the “0” seems farther from the viewer, not because the lines are printed on the back of the banknote, but because the 2D image formed by the arrangement of lines simulates a perspective that gives the visual impression of depth independently from the actual thickness of the banknote. This 3D effect is provided even with a viewing angle normal to the surface.

It is noted that, in this example, the appearance of the 3D image looks like a shadow watermark, but is not linked to any variation in the paper thickness.

In summary, in the presently claimed invention, the 3D effect is provided by the arrangement of the lines to be viewed as a 2D image that is designed so as to produce the visual impression of a 3D image (for example, using perspective through line density and/or printing intensity, as recited in claim 2, or line density and/or shape, as in the illustrative specimen discussed above). This is in contrast to Zeiter where the 3D effect is only due to the actual 3D image having a depth, i.e., due to the lines being staggered in the depth dimension.

Further, an advantage of the presently claimed invention is that even a subtle shift between the printed indicia on the front face and on the back face will affect the 3D visual impression of the pattern in a way that is immediately detected, so that protection against

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counterfeiting can be improved, as explained in the present specification, for example, on page 6, last paragraph. The features of the presently claimed invention and their advantages are not taught or suggested in Zeiter, and the other cited references fail to remedy the deficiencies of Zeiter. Further, there would have been no motivation or incentive. Therefore, the present claims are not anticipated by Zeiter, and not obvious over Zeiter taken alone or in any combination with the other cited references.

In addition, with respect to the dependent claims, it is submitted that the combined features of each of the dependent claims are not taught or suggested in the cited references taken alone or in any combination. In particular, with respect to claim 2, it is submitted that none of the cited references teaches or suggests that a 2D image having the appearance of a 3D image could be obtained by an arrangement of lines having (i) variable number density per unit of area, (ii) variable printing intensity, or (iii) both variable number density per unit of area and variable printing intensity, as recited in present claim 2. Specifically, Zeiter forms an actual 3D “moiré” image due to the depth of the image, but the lines are not used to represent a 2D image with a 3D visual impression. Therefore, each of the dependent claims, and in particular claim 2, are not obvious over the cited references taken alone or in any combination.

In view of the above, it is submitted that the rejections should be withdrawn.

In conclusion, the invention as presently claimed is patentable. It is believed that the claims are in allowable condition and a notice to that effect is earnestly requested.

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If there is, in the Examiner's opinion, any outstanding issue and such issue may be resolved by means of a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

If this paper is not considered to be timely filed, the Applicants hereby petition for an appropriate extension of the response period. Please charge the fee for such extension and any other fees which may be required to Deposit Account No. 50-2866.

Respectfully submitted,
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